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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/839,209	04/23/2001	Katsunori Tanaka	Q63408	3746

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SUGHRUE, MION, ZINN, MACPEAK & SEAS
2100 Pennsylvania Avenue, N.W.
Washington, DC 20037

EXAMINER

NGUYEN, TRAN N

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 11/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/839,209

Applicant(s)

TANAKA ET AL.

Examiner

Tran N. Nguyen

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 30 September 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 April 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. *Figure 12 should be designated by a legend such as --Prior Art--* because only that which is old is illustrated, as disclosed in the spec, page 1 lines 7+.

See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. **Claim 8** is rejected under 35 U.S.C. 112, *first paragraph*, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 8 recites “*said restricting means is only disposed in the vicinity of the tips of the magnetic poles of said first and second pole core members to restrict the displacement of the pole tips.*” This recitation does not have support from the spec.

The specification, pages 10-11, discloses that as illustrated in figs 10-11, restriction members (46) are fitted on the tip portions and the root portions of the magnetic poles (23, 24) of the pole core members (21, 22). Also, tape (49) secured on the entire outer circumference of the rotor (48) so that displacement restriction function can be further improved. Thus, the spec. does not provide any description to support in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed limitations of *said restricting means is only disposed in the vicinity of the tips of the magnetic poles of said first and second pole core members.*

If the applicant believes that the Examiner has overlooked the disclosure of this features in the spec., kindly point out the exact page and line numbers in thereof.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1 , 6-9 and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior-Art figure 12, (hereafter **AAPA fig 12**) in view of **Iwata** (US 5800728) and **Mukai** et al (US 5903083).

According to the present application's Background of the Invention, pages 1-2, the AAPA fig 12 is a sectional side view of a conventional, i.e., prior-art, alternator comprising:

a stator (8) being disposed within brackets (1, 2) having exhaust windows (17);

a rotor having rotor coil (13) for generating a magnetic flux, a pole core having first and second pole members (21, 22), each is provided with pawl-shaped magnetic poles (23, 24) projecting in a intermeshed relationship to cover the rotor coil;

a plurality of permanent magnets (PMs) disposed in between the pawl poles;

a fan (5) mounted to each of opposite axial ends of the rotor for cooling therein;

The AIPA fig 2 substantially discloses the claimed invention, except for the following:

(a) the permanent magnets (PMs) is of samarium-iron alloy containing titanium (Ti) and Boron (B);

(b) the stator is a three-phase winding;

(c) the PMs are disposed on and connected to both side surfaces of the pawl shaped magnetic poles; and, outer circumference restricting means for restricting the displacement of the magnetic poles in the radial direction due to centrifugal force.

Regarding limitations of subsection (a), Iwata teaches a PM is of samarium-iron alloy containing titanium (Ti) and Boron (B). Iwata discloses that the composition of the permanent magnet of samarium-iron alloy containing titanium and boron would have superior magnetic characteristics.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the Mukai's rotor by selecting PM material composition of samarium-iron alloy containing titanium and boron, as taught by Iwata. Doing so would enable to improve efficiency of the alternator due to rotor having magnets with superior magnetic characteristics. Furthermore, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding limitations of subsections (b), Mukai teaches an alternator having stator is provided with three-phase winding. Those skilled in the art would realize that three-phase winding in the alternator's stator is the most efficient winding configuration for the alternator, particularly vehicle alternator. The Examiner takes Official Notice that alternators having stators with three phase windings are well known in the art.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the AAPA's alternator by providing the stator with three-phase winding, as taught by Mukai. Doing so would enhance the efficiency of the alternator. Furthermore, doing so would require only routine skills in the art since alternators having three-phase are well known in the art.

Regarding limitations of subsections (c), AAPA discloses that the PMs are located between the pawl poles, but does not clearly disclose that the PMs are disposed on both sides and connected to both surfaces of the poles. Also, AAPA does not provide restricting means to further secure the PMs and the pawl poles from radially displacement due to centrifugal force during the rotor rotation.

Mukai, however, teaches an alternator having a rotor with PMs are disposed on both sides of the pawl poles (fig 7); and the PMs are connected to both side surfaces of the pawl shaped magnetic poles with the outer circumference restricting means (32, fig 7) for restricting the displacement of the magnetic poles in the radial direction due to centrifugal force. Furthermore, Mukai teaches that the material for the restricting means can be selected from nonmagnetic material such as stainless steel or resinous material (col 3 lines 1-3). Those skilled in the art would realize that stainless steel and resinous materials are not only known for their high tensile strength but also known for their oxidation-resistant characteristics, i.e., stainless steel and resin do not get rust. Hence, the Mukai's restricting means would have a high structural reliability with long lasting service life without any potential damage due to oxidation.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the AAPA's alternator by disposing the respective PMs on both side of the pawl poles and connected to both side surfaces of the pawl pole the outer circumference restricting means, as taught by Mukai. Doing so would ensure the abutment between the PMs and the pawls poles as well as provide non-corrosive highly-reliable restricting means to keep the components from radially displacement due to centrifugal force during rotor rotation.

Regarding limitations of claim 8, amended claimed language recites that the restricting means is only disposed in the vicinity of the tips of the pawl poles. Mukai teaches the restricting means are provided at equal intervals from the root to the tip of the pawl poles. Those skills in the art would realize that the Mukai's essential teaching is that to provide outer circumferential

restricting means to restrains the PMs and pawl poles from radially displacement. Thus, it would have been obvious to an artisan to apply the Mukai's important teaching of providing the restricting means for the rotor. Whether the restricting means are disposed at equal intervals from the root to the tip of the pawl poles, as taught by Mukai— notice that Mukai *does* teach the restricting means is disposed in the vicinity of the tips of the pawl poles— or, as recited in the claimed invention, *only disposed in the vicinity of the tips* is a matter of obvious engineering design choice based upon size and weight of the rotor, as well as a particular industrial application thereof.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the AAPA's alternator by disposing the restricting means only in the vicinity of the tips of the pawl poles. Doing so would be an obvious engineering design choice based upon size and weight of the rotor, as well as a particular industrial application thereof, and it would be an application of the Mukai teaching of providing restricting means in the vicinity of the tips of the pawl poles, along with other equally interval spaced areas of the pawl pole, for preventing radially displacement.

3. **Claims 2-3** are rejected under 35 U.S.C. 103(a) as being unpatentable over **AAPA Mukai, and Iwata**, as applied in the rejection against the base claim, and further in view of **Nagayama et al (US 5779453)**.

The combination of **AAPA Mukai, and Iwata**, refs substantially discloses the claimed invention, except for the added limitations of the following:

- (a) the PMs are magnet powder bonded by resin, as in claim 2;
- (b) the PMs are bonded magnets of Sm sub. 8.2, Fe sub. 75.6, Ti sub. 2.3, Boron sub. 0.9 and N sub. 13, as in claim 3.

Regarding limitations in subsection (4a), Nagayama, teaches a rotor magnets (5a, 5b) that are magnet powder bonded by resin. Nagayama teaches that the magnet powder bonded by resin would prevent eddy current being generated in the PM resulting in reducing heat in the rotor.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the rotor of the alternator by selecting PM of magnet powder bonded by resin, as taught by Nagayama. Doing so would prevent eddy current being generated in the PM resulting

in reducing heat in the rotor. Furthermore, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding limitations in subsection (4b), Iwata discloses a samarium-iron alloy containing titanium (Ti) and Boron (B) as well as Nitrogen (N). Iwata does not disclose the specific composition formula as recited in claim 3. However, those skilled in the art would understand that Iwata generally discloses the PM composition for producing high magnetic characteristics. It would have been obvious to an artisan to apply the Iwata's teaching of magnet material composed of Sm Fe Ti B N with specific material composition as in claim 3.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to select bonded PMs of material composition: Sm sub. 8.2, Fe sub. 75.6, Ti sub. 2.3, Boron sub. 0.9 and N sub. 13. Doing so would require only routine skill in the art to select a suitable material for the intended use of the component. It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

4. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA Mukai, and Iwata, as applied in the rejection against the base claim, and further in view of **Harris et al** (US 5793143).

The combination of **AAPA, Mukai, and Iwata** refs substantially discloses the claimed invention, except for the added limitations of the following: corrosion-resistive holding members surrounding the PMs support the PMs.

Harris, however, teaches a rotor having a plurality of PMs (38), each of which is surrounded by a corrosion-resistive holding member (36) for securely holding the PMs in place and protecting the PMs against corrosion (col 2 lines 43-56).

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the rotor by embodying the PMs with corrosion-resistive holding member, as taught by Harris. Doing so would provide means for securely holding the PMs in place and protecting the PMs against corrosion.

In response to applicant's argument about the rotor structure with pocket (36) of the Harris ref, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case Harris does teach the PMs (38) are supported by corrosion-resistive holding members (36) which completely surrounding and sealed the PMs (38) therein for fully enclosing the PMs and protecting them from corrosion (col 2 lines 42-55).

5. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA Mukai, and Iwata, as applied in the rejection against the base claim, and further in view of **Akiyoshi** et al (JP 40-5211741, pubn-date 8/20/92).

The combination of **AAPA, Mukai, and Iwata** refs substantially discloses the claimed invention, except for the added limitations of at least one portion of the side opposing to the claw pole side surfaces of the magnets is resin coated.

Akiyoshi, however, teaching the PM (6) is fixed to the rotor core (5) by coating resin (7). It has been held that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this instant case, those skilled in the art would understand that the important teaching of the **AKiyoshi** ref is to affix PMs to the accommodating component with resin. Resin is a well know bonding agent which is

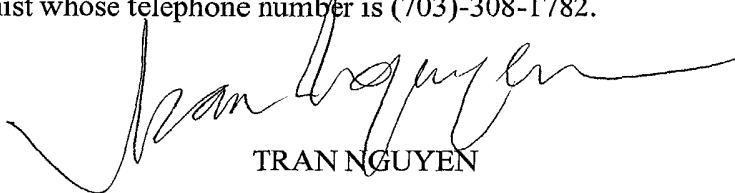
commonly used as adhesive material to attach structural components without additional fastening parts that would not only increase in part counts of the rotor assembly but also may interfere with the magnetic circuit therein. Furthermore, resin is a corrosion resistant material. Therefore, coating the PMs with the resin would have additional advantage of preventing the PMs from oxidation.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to apply the Akiyoshi's teaching by providing a coat of resin affixing the PMs onto the pawl pole side surface. Doing so would not only provide simple fastening means between the PMs and the pawl poles but also prevent corrosion for the PMs since resin is a corrosion resistant material.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tran N Nguyen whose telephone number is (703) 308-1639. The examiner can normally be reached on M-F 6:00AM-2:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703)-308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3431 for regular communications and (703)-395-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-1782.



TRAN NGUYEN

PRIMARY PATENT EXAMINER

TC-2800